

**REMARKS/ARGUMENTS**

Upon entry of this amendment, claims 5, 12 and 13 will be canceled without prejudice or disclaimer of the subject matter recited therein, claims 1, 7 and 26 will be amended, and claim 27 will be added, whereby claims 1-27 will be pending. Claims 1, 24, 25 and 26 are independent claims.

Support for the amendments to the claims appears throughout the originally filed application, including the originally filed claims and paragraph [0045].

Reconsideration and allowance of the application are respectfully requested.

**Information Disclosure Statement**

Applicants express appreciation for the attachment to the Office Action of an initialed copy of the Form PTO-1449 submitted with the Information Disclosure Statement, filed August 2, 2001.

Applicants note that six documents listed in the Foreign Patent Documents section of the form are crossed through and not initialed, and include the indication "No translation or statement of relevancy". However, in contrast to this assertion, the Information Disclosure Statement notes that the documents are cited and discussed in the specification, and also provides English language family members including English language Abstracts and English language patent document family members.

In particular, Applicants note the following:

DE 195 04 930 is cited and discussed in the specification beginning in paragraph [0087] and is accompanied by family member U.S. Patent No. 5,858,097;

DE 26 42 383 A1 is cited and discussed in the specification beginning in paragraph [0048] and is accompanied by family member Canadian Patent No. 1,066,483;

DE 30 27 012 A1 is cited and discussed in the specification beginning in paragraph [0048] and is accompanied by family member U.S. Patent No. 4,329,241;

DE 44 27 821 A1 is cited and discussed in the specification beginning in paragraph [0048] and is accompanied by an English language abstract – Moreover, Applicants attach hereto a copy of a family member list for DE4427821 accompanied by U.S. Patent Nos. 5,916,539, 5,928,958 and 6,274,121 which are cited in the family list;

EP 0 654 165 is cited and discussed in the specification beginning in paragraph [0088] and is accompanied by family member U.S. Patent No. 5,601,647

FR 2 734 500 is cited and discussed in the specification beginning in paragraph [0088] and is accompanied by family member U.S. Patent No. 5,704,978.

In view of the above, each of the crossed through documents should be properly considered by the Examiner. Therefore, Applicants are submitting a Form PTO-1449 listing these documents and the three newly-cited U.S. patent family members. Applicants therefore respectfully request that the form be initialed, and an initialed copy of the form be forwarded to Applicants with the next communication from the Patent and Trademark Office.

Applicants respectfully submit that a fee should not be necessary for consideration of this disclosure statement. However, if any fee is required, authorization is hereby provided to charge any required fee, including any fee under 37 C.F.R. 1.17(p), to Deposit Account No. 19-0089.

**Response To Maintaining Of The Restriction Requirement**

Applicants note that the Cover Sheet of the Office Action indicates that claims 24 and 25 are withdrawn from consideration. In response, Applicants once again respectfully request rejoinder of the non-elected process claims 24 and 25 upon allowance of the elected group of invention.

**Prior Art Rejections**

The following rejections are set forth in the Official Action:

- (a) Claims 1-4, 6, 8, 10, 12, 14, 16, 21 and 26 are rejected under 35 U.S.C. 102(b) as being anticipated by Matsubaguchi et al. (hereinafter "Matsubaguchi"), U.S. Patent No. 6,030,689.
- (b) Claims 5, 7, 9, 11, 13, 15 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Matsubaguchi, U.S. Patent No. 6,030,689, in view of Hisano et al. (hereinafter "Hisano"), U.S. Patent No. 6,440,545.
- (c) Claims 18-20, 22 and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Matsubaguchi, U.S. Patent No. 6,030,689, in view of Hisano, U.S. Patent No. 6,440,545 and Ejiri et al. (hereinafter "Ejiri"), U.S. Patent No. 6,143,403.

In response to the rejections of record, Applicants note the following:

Applicants' invention as recited in independent claim 1 is directed to a multilayer magnetic recording medium which comprises, on a nonmagnetic substrate, at least one upper binder-containing magnetic recording layer which has a thickness of less than 0.5  $\mu\text{m}$  and contains finely divided magnetic pigment having a coercive force  $H_c$  of 80 - 250 kA/m, and at least one lower binder-containing layer which contains an isotropic magnetically soft pigment which comprises  $\gamma$ -

$\text{Fe}_2\text{O}_3$ ,  $\text{Fe}_3\text{O}_4$  or a solid solution of these components, the coercive force  $H_c$  of the lower layer being less than 4 kA/m and the anhysteretic susceptibility of the lower layer at 2 kA/m being greater than 7, said isotropic magnetically soft pigment having a mean crystallite size of from 7 to 17 nm, a specific surface area determined on the basis of the BET method is more than  $70 \text{ m}^2/\text{g}$ , and a spherical, cubic or amorphous shape.

Moreover, Applicants' independent claim 26 is directed to a magnetic tape, magnetic card or floppy disk comprising a multilayer magnetic recording medium which comprises, on a nonmagnetic substrate, at least one upper binder-containing magnetic recording layer which has a thickness of less than 0.5  $\mu\text{m}$  and contains a finely divided magnetic pigment having a coercive force  $H_c$  of 80 - 250 kA/m, and at least one lower binder-containing layer which contains an isotropic magnetically soft pigment which comprises  $\gamma\text{-Fe}_2\text{O}_3$ ,  $\text{Fe}_3\text{O}_4$  or a solid solution of these components, the coercive force  $H_c$  of the lower layer being less than 4 kA/m and the anhysteretic susceptibility of the lower layer at 2 kA/m being greater than 7, said isotropic magnetically soft pigment having a mean crystallite size of from 7 to 17 nm, a specific surface area determined on the basis of the BET method is more than  $70 \text{ m}^2/\text{g}$ , and a spherical, cubic or amorphous shape.

In contrast to Applicants' disclosed and claimed invention, the non-magnetic or soft-magnetic particles of the lower layer according to Matsubaguchi are acicular and have an average long axis length of from 0.04 to 020  $\mu\text{m}$ , such as disclosed in the Abstract, which corresponds to 40 to 200 nm, whereas the soft magnetic particles according to the presently claimed invention are smaller having a size of 7 to 17 nm, and have a spherical, cubic or amorphous shape.

Still further, Matsubaguchi is silent on the use of isotropic soft magnetic particles for the lower layer. Instead of this, acicular particles with a specific acicular ratio are consistently used in the Examples of Matsubaguchi. This results in a significant practical difference. In particular, isotropic magnetic particles exhibit the same maximum magnetization in all directions, whereas acicular magnetic particles have their maximum magnetization only in one direction.

Still further, Applicants note that the non-magnetic or soft-magnetic particles of the lower layer according to Matsubaguchi have a preferred specific surface area from 40 to 70 m<sup>2</sup>/g, such as disclosed in Matsubaguchi at column 11, lines 29-31, and the Examples, whereas the soft magnetic particles according to the presently claimed invention have a BET value of more than 70 m<sup>2</sup>/g, preferably more than 100 m<sup>2</sup>/g, such as disclosed at paragraph [0045].

Accordingly, each and every element of the disclosed and claimed invention is not disclosed in Matsubaguchi.

Still further, the remaining documents utilized in the rejections of record do not overcome the deficiencies of Matsubaguchi. In particular, Applicants respectfully submit that one having ordinary skill in the art would not combine the prior art in the manner asserted in the rejection. Moreover, even if for the sake of arguments the documents were combined, Applicants' disclosed and claimed invention would not be at hand.

The prior art clearly teaches away from Applicants' disclosed and claimed invention. For example, the particles disclosed for the lower layer of Matsubaguchi and, in particular, those which are preferably used in the Examples of Matsubaguchi are different than those disclosed and claimed by Applicants. Consequently, the documents utilized in the rejection does not include a media

having the advantageous features of the Applicants' disclosed and claimed invention. For examples the Examiner's attention is directed to paragraphs [0045] and [0034] of Applicants' specification.

Thus, for example, Applicants note that, as disclosed in paragraph [0045], owing to the finely divided character of the pigment, its specific surface area (SSA) is increased. This specific surface area determined on the basis of the BET method is more than 70, in particular more than 100,  $\text{m}^2/\text{g}$ . This contributes toward greater porosity in the lower layer. By means of the adsorption on the large surface of the magnetically soft pigments and the greater pore volume in the lower layer it is possible, with identical layer thickness, for a larger amount of lubricant to be absorbed in the lower layer in comparison with particles having a larger particle size, which amount of lubricant can be gradually released to the upper layer during a long period of use of the magnetic recording media and thus keeps the friction of the magnetic layer low even on prolonged operation of the medium. The adsorption of more than 6, preferably more than 7, % by weight of lubricant can thus be achieved, based on the total weight of the pigments in the lower layer.

Still further, as disclosed in paragraph [0034], if the crystallite size falls below 7 nm, it is not possible to obtain in the lower layer tape magnetization which is sufficiently high to enable the effects of the present invention, in particular a flattening of the frequency response, to be achieved. If, on the other hand, the mean crystallite size exceeds 17 nm, the roughness of the surface of the lower layer and hence also of the surface of the upper layer is increased so that there is a large drop in output level over the total wavelength range.

Hisano and Erji do not teach or suggest the use of soft-magnetic pigments characterized by the specific combination of parameters for the lower layer, and the advantages associated with

Applicants' invention. For example, Hisano discloses acicular particles, the preferred major axis length, such as disclosed in the examples, being in the range of 100 to 150 nm.

Still further, while Applicants respectfully submit that a *prima facie* case of obviousness has not been established, and unexpected results are not necessary for establishing patentability, Applicants note the surprising advantages associated with their invention, which advantages are disclosed throughout their specification as discussed above, and are included in Applicants' Examples.

Moreover, Applicants note that the rejection asserts inherency at the bottom of page 5 of the Office Action arguing that the anhysteretic susceptibility is predetermined by the type of pigment. Therefore, the rejection must conclude that that prior art pigments are different from the pigments of the presently claimed invention also in this respect, and do not render obvious the surprising advantages associated with susceptibility values above 7. In this regard, the Examiner's attention is directed to Tables 1 and 2 on pages 20 and 21 of Applicants' specification.

As noted by Applicants in their previous response, and as disclosed for example, in paragraphs [0026] and [0027] of the present specification, surprisingly, the recording medium according to the present invention has a flat frequency response which has lower values at long recording wavelengths than, for example, conventional recording media having the same thickness of the recording layer and of the nonmagnetic lower layer. Consequently, there are no problems of magnetic saturation of the head and associated signal distortion at long wavelengths. Moreover, the magnetically soft lower layer partially short-circuits the magnetic flux of the upper layer so that the magnitude of the signal level is reduced. This effect is wavelength-dependent and is most

pronounced at long wavelengths. The result is a flattening of the frequency response, the effect of which in the region of long recording wavelengths is that saturation of the magnetoresistive read head no longer occurs, while only a marginal reduction in the signal level has to be accepted in the region of short recording wavelengths.

Accordingly, Applicants respectfully submit that the rejections of record are without appropriate basis for at least the reasons set forth above. Therefore, the rejections of record should be withdrawn, the non-elected claims should be rejoined, and all the pending claims should be indicated to be allowed.

### CONCLUSION

In view of the foregoing, the Examiner is respectfully requested to reconsider and withdraw the rejections of record, and allow each of the pending claims.

Applicants therefore respectfully request that an early indication of allowance of the application be indicated by the mailing of the Notices of Allowance and Allowability.

Should the Examiner have any questions regarding this application, the Examiner is invited to contact the undersigned at the below-listed telephone number.

Respectfully submitted,  
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